Personal information

Name: **Paul J. Maddon, M.D., Ph.D.**
Birthdate: 15 September, 1959
Birthplace: Brooklyn, NY
Citizenship: USA
Marital status: Married, 2 children
Home address: 191 Fox Meadow Road, Scarsdale, NY 10583

Education

B.A. Columbia College of Columbia University (1981)
Summa Cum Laude, Phi Beta Kappa
Majors-Biochemistry and Mathematics

M.D. College of Physicians and Surgeons, Columbia University (1988)

Ph.D. Graduate School of Arts and Sciences, Columbia University (1988)
Biochemistry and Molecular Biophysics
Thesis - Isolation and Characterization of the Gene Encoding T4 (CD4): A Receptor Mediating Cell-Cell and Cell-HIV Interactions
Advisor - Dr. Richard Axel

Appointments

Chairman, Chief Executive Officer, Chief Science Officer, & Founder (1988-present)
Progenics Pharmaceuticals, Inc.
777 Old Saw Mill River Road, Tarrytown, NY, 10591

Adjunct Assistant Professor (1989-present)
Department of Medicine, College of Physicians and Surgeons
Columbia University, New York, NY, 10032

Honors

Westinghouse Science Talent Search National Winner (1977)
International Science and Engineering Fair Finalist (1977)
New York State Regents Scholarship (1977-81)
Phi Beta Kappa, Summa Cum Laude, and Phi Lambda Upsilon, Columbia University (1981)
Medical Scientist Training Program (MSTP) NIH Grant Recipient (1981-87)
Dr. Alfred Steiner Award for Biomedical Research, Columbia University (1985)
Dr. Harold Lamport Biomedical Research Prize, Columbia University (1989)
ICAAC/Merck Young Investigator Award, American Society for Microbiology (1990)

Professional activities

Editorial Board: *Journal of Virology* (1994-2002); *AIDS Research and Human Retroviruses* (1990-present)

Reviewer: *AIDS Research and Human Retroviruses* (1990-present); *Journal of Acquired Immune Deficiency Syndromes* (1991-present); *Journal of Clinical Investigation* (1990-present); *Journal of Immunology* (1990-present); *Journal of Infectious Diseases* (1993-present); *Journal of Virology* (1989-present); *Molecular and Cellular Biology* (1992-present); *Proceedings of the National Academy of Sciences USA* (1989-present); and *Science* (1992-present)

NIH Study Section Member: National Cooperative Drug Discovery Group for HIV, NIAID, 1993; HIV Vaccine Preclinical Development, 1994; Biological and Physiological Sciences, SBIR/STTR, 1996-present; AIDS and Related Research 1 (ARRA), NIAID, 1997-1998; Microbiological and Immunological Sciences, SBIR/STTR, 1997-1998; Novel HIV Therapies: Integrated Preclinical/Clinical Program, NIAID, 1999; Vaccine Study Section, NIAID, 1999 & 2001 (Chairman); AIDS Vaccine Program Site Visit Team, NCI, 1999; HIV Special Emphasis Panel, NINDS, 1999; HIV Vaccine Trials Network Units, NIAID, 2000

Section Chairman, V International Conference on AIDS, Montreal, 1989

Chairman, AIDS Research Symposium, Columbia University, Arden House, NY, 1991

Section Chairman, Annual Meeting of the Laboratory of Tumor Cell Biology, 1993

Member, New York State Science and Technology Foundation Scientific Review Committee, Centers for Advanced Technology, 1994

Member, Innovation Enhancement Fund Advisory Board, Columbia University, 1994-present

Reviewer, International Human Frontier Science Program, 1995-present

Director, New York Biotechnology Association, 1999-2002

Consultant, Health Sciences Division, The Rockefeller Foundation, 1999-present

Research grant support

20 funded federal research grants from the National Institutes of Health and the Department of Defense as Principal or co-Principal Investigator in the area of HIV research

Selected scientific publications

Maddon, P.J., Littman, D.R., Godfrey, M., Maddon, D.E., Chess, L., and Axel, R. (1985). The isolation and nucleotide sequence of a cDNA encoding the T cell surface protein T4: a new member of the immunoglobulin gene family. Cell *42*, 93-104.

Littman, D.R., Thomas, Y., **Maddon, P.J.**, Chess, L. and Axel, R. (1985). The isolation and sequence of the gene encoding T8: a molecule defining functional classes of T lymphocytes. Cell *40*, 237-246.

Maddon, P.J., Dalgleish, A.G., McDougal, J.S., Clapham, P.R., Weiss, R.A., and Axel, R. (1986). The T4 gene encodes the AIDS virus receptor and is expressed in the immune system and the brain. Cell *47*, 333-348.

Isobe, M., Huebner, K., **Maddon, P.J.**, Littman, D.R., Axel, R., and Croce, C.M. (1986). The gene encoding the T-cell surface protein T4 is located of human chromosome 12. Proc. Natl. Acad. Sci. USA *83*, 4399-4402.

Maddon, P.J., Molineaux, S.M., Maddon, D.E., Zimmerman, K.A., Godfrey, M., Alt, F.W., Chess, L., and Axel, R. (1987). Structure and expression of the human and mouse T4 genes. Proc. Natl. Acad. Sci. USA *84*, 9155-9159.

Gay, D., **Maddon, P.J.**, Sekaly, R., Talle, M.A., Godfrey, M., Long, E., Goldstein, G., Chess, L., Axel, R., Kappler, J., and Marrack, P. (1987). Functional interaction between human T-cell protein CD4 and the major histocompatiblity complex HLA-DR antigen. Nature *328*, 626-628.

Maddon, P.J., McDougal, J.S., Clapham, P.R., Dalgleish, A.G., Jamal, S., Weiss, R.A., and Axel, R. (1988). HIV infection does not require endocytosis of its receptor, CD4. Cell *54*, 865-874.

Deen, K.C., McDougal, J.S., Inacker, R., Folena-Wasserman, G., Arthos, J., Rosenberg, J., **Maddon, P.J.**, Axel, R., and Sweet, R. (1988). A soluble form of CD4 (T4) inhibits AIDS virus infection. Nature *331*, 82-84.

Malkovsky, M., Philpott, K., Dalgleish, A.G., Mellor, A.L., Patterson, S., Webster, A.D.B., Edwards, A.J., and **Maddon, P.J.** (1988). Infection of B lymphocytes by the human immunodeficiency virus and their susceptibility to cytotoxic cells. Eur. J. Immunol. *18*, 1315-1321.

Arthos, J., Deen, K.C., Chaikin, M.A., Fornwald, J.A., Sathe, G., Sattentau, Q.J., Clapham, P.R., Weiss, R.A., McDougal, J.S., Pietropaolo, C., Axel, R., Truneh, A., **Maddon, P.J.**, and Sweet, R.W. (1989). Identification of the residues in human CD4 critical for the binding of HIV. Cell *57*, 469-481.

Ibegbu, C.C., Kennedy, M.S., **Maddon, P.J.**, Deen, K.C., Hicks, D., Sweet, R.W., and McDougal, J.S. (1989). Structural features of CD4 required for binding to human immunodeficiency virus (HIV). J. Immunol. *142*, 2250-2256.

Clapham, P.R., Weber, J.N., Whitby, D., McIntosh, K., Dalgleish, A.G., **Maddon, P.J.**, Deen, K.C., Sweet, R.W., and Weiss, R.A. (1989). Soluble CD4 blocks the infectivity of diverse strains of HIV and SIV for T cells and monocytes but not for brain and muscle cells. Nature *337*, 368-370.

Klatzmann, D.R., McDougal, J.S., and **Maddon, P.J.** (1990). The CD4 molecule and HIV infection. Immunodef. Rev. *2*, 43-66.

Orloff, G.M., Orloff, S.L., Kennedy, M.S., **Maddon, P.J.**, and McDougal, J.S. (1991). Penetration of CD4+ T cells by HIV-1. The CD4 receptor does not internalize with HIV, and CD4-related signal transduction events are not required for entry. J. Immunol. *146*, 2578-2587.

McDougal, J.S., Klatzmann, D.R., and **Maddon, P.J.** (1991). CD4-gp120 interactions. Cur. Op. in Immunol. *3*, 552-558.

Kennedy, M.S., Orloff, S., Ibegbu, C.C., Odell, C.D., **Maddon, P.J.**, and McDougal, J.S. (1991). Analysis of synergism/antagonism between HIV-1 antibody-positive human sera and soluble CD4 in blocking HIV-1 binding and infectivity. AIDS Res. Hum. Retroviruses *7*, 975-981.

Chams, V., **Maddon, P.J.**, and Klatzmann, D.R. (1992). A simple assay to screen for inhibitors of the interaction between the human immunodeficiency virus envelope

glycoprotein and its cellular receptor, CD4. Antimicrob. Agents Chemother. *36*, 267-272.

Orloff, S.L., Kennedy, M.S., Belperron, A.A., **Maddon, P.J.**, and McDougal, J.S. (1993). Two mechanisms of soluble CD4 (sCD4)-mediated inhibition of human immunodeficiency virus (HIV-1) infectivity and their relation to primary HIV-1 isolates with reduced sensitivity to sCD4. J. Virol. *67*, 1461-1471.

Allaway, G.P., Ryder, A.M., Beaudry, G.A., and **Maddon, P.J.** (1993). Synergistic inhibition of HIV-1 envelope-mediated cell fusion by CD4-based molecules in combination with antibodies to HIV gp120 or gp41. AIDS Res. Hum. Retroviruses *9*, 581-587.

Orloff, S.L., Bandea, C.I., Kennedy, M.S., Allaway, G.P., **Maddon, P.J.**, and McDougal, J.S. (1995). Increase in sensitivity to soluble CD4 (sCD4) by primary HIV-1 isolates after passage through C8166 cells: association with sequence differences in the first constant (C1) region of gp120. AIDS Res. Hum. Retroviruses *11*, 335-342.

Allaway, G.P., Davis-Bruno, K.L., Beaudry, G.A., Garcia, E.B., Wong, E.L., Ryder, A.M., Hasel, K.W., Gauduin, M.-C., Koup, R.A., McDougal, J.S., and **Maddon, P.J.** (1995). Expression and characterization of CD4-IgG2, a novel heterotetramer which neutralizes primary HIV-1 isolates. AIDS Res. Hum. Retroviruses *11*, 533-539.

Trkola, A., Pomales, A.P., Yuan, H., Korber, B., **Maddon, P.J.**, Allaway, G.P., Katinger, H., Barbas III, C., Burton, D.R., Ho, D.D., and Moore, J.P. (1995). Cross-clade neutralization of primary isolates of human immunodeficiency virus type 1 by human monoclonal antibodies and tetrameric CD4-IgG2. J. Virol. *69*, 6609-6617.

Gauduin, M.-C., Allaway, G.P., **Maddon, P.J.**, Barbas, C.F., Burton, D.R., and Koup, R.A. (1995). Effective *ex vivo* neutralization of plasma HIV-1 by recombinant immunoglobulin molecules. J. Virol. *70*, 2586-2592.

Dragic, T., Litwin, V., Allaway, G.P., Martin, S., Huang, Y., Nagashima, K.A., Cayanan, C., **Maddon, P.J.**, Koup, R.A., Moore, J.P., and Paxton, W.A. (1996). HIV-1 entry into CD4+ cells is mediated by the chemokine receptor CC-CKR-5. Nature *381*, 667-673.

Litwin, V., Nagashima, K.A., Ryder, A.M., Chang, C-H., Carver, J.M., Olson, W.C., Alizon, M., Hasel, K.W., **Maddon, P.J.**, and Allaway, G.P. (1996). Human immunodeficiency virus type 1 membrane fusion mediated by a laboratory-adapted strain and a primary isolate analyzed by resonance energy transfer. J. Virol. *70*, 6437-6441.

Trkola, A., Dragic, T., Arthos, J., Binley, J., Olson, W.C., Allaway, G.P., Cheng-Mayer, C., Robinson, J., **Maddon, P.J.**, and Moore, J.P. (1996). CD4-dependent, neturalizing antibody-sensitive interactions between HIV-1 and its co-receptor CCR-5. Nature *384*, 184-187.

Dragic, T., Trkola, A., Lin, S.W., Nagashima, K.A., Kajumo, F., Zhao, L., Olson, W.C., Wu, L., Mackay, C.R., Allaway, G.P., Sakmar, T.P., Moore, J.P., and **Maddon, P.J.** (1998). N-terminal substitutions in the CCR5 co-receptor impair gp120 binding and HIV-1 entry. J. Virol. *72*, 279-285.

Donzella, G.A., Schols, D., Lin, S.W., Este, J.A., Nagashima, K.A., **Maddon, P.J.**, Allaway, G.P., Sakmar, T.P., Henson, G., De Clercq, E., and Moore, J.P. (1998).

AMD3100, a small molecule inhibitor of HIV-1 entry via the CXCR4 co-receptor. Nature Medicine *4*, 72-77.

Gauduin, M.-C., Allaway, G.P., Olson, W.C., Weir, R., **Maddon, P.J.**, and Koup, R.A. (1998). CD4-IgG2 protects hu-PBL-SCID mice against challenge by primary HIV type 1 isolates. J. Virol. *72*, 3475-3478.

Olson, W.C., Rabut, G.E.E., Nagashima, K.A., Tran, D.N.H., Anselma, D.J., Monard, S., Segal, J.P., Thompson, D.A.D., Kajumo, F., Guo, Y., Moore, J.P., **Maddon, P.J.**, and Dragic, T. (1999). Differential inhibition of human immunodeficiency virus type 1 fusion, gp120 binding, and CC-chemokine activity by monoclonal antibodies to CCR5. J. Virol. *73*, 4145-4155.

Binley, J.M., Sanders, R.W., Clas, B., Schuelke, N., Master, A., Guo, Y., Kajumo, F., **Maddon, P.J.**, Olson, W.C., and Moore, J.P. (2000). A recombinant human immunodeficiency virus type 1 envelope glycoprotein complex stabilized by an intermolecular disulfide bond between the gp120 and gp41 structure is an antigenic mimic of the trimeric virion-associated structure. J. Virol. *74(2)*, 627-643.

Jacobson, J.M., Lowy, I., Fletcher, C.V., O'Neill, T.J., Tran, D.N.H., Ketas, T.J., Trkola, A., Klotman, M.E., **Maddon, P.J.**, Olson, W.C., and Israel, R.J. (2000). Single-dose safety, pharmacology and antiviral activity of the human immunodeficiency virus (HIV) type 1 entry inhibitor PRO 542 in HIV-infected adults. J. Inf. Dis. *182*, 326-329.

Shearer, W.T., Israel, R.J., Starr, S., Fletcher, C.V., Wara, D., Rathore, M., Church, J., DeVille, J., Fenton, T., Graham, B., Samson, P., Staprans, S., McNamara, J., Moye, J., **Maddon, P.J.**, and Olson, W.C. for the Pediatric AIDS Clinical Trials Group Protocol 351 Study Team (2000). Recombinant CD4-IgG2 in HIV-1 infected children: Phase I/II study. J. Inf. Dis. *182*, 174-179.

Trkola, A., Ketas. T.J., Nagashima, K.A., Zhao, L., Cilliers, T., Morris, L., Moore, J.P., **Maddon, P.J.**, and Olson, W.C. (2001). Potent, broad-spectrum inhibition of human immunodeficiency type 1 virus (HIV-1) by the CCR5 monoclonal antibody PRO 140. J. Virol. *75(2)*, 579-588.

Nagashima, K.A., Thompson, D.A.D., Rosenfield, S.I., **Maddon, P.J.**, Dragic, T., and Olson, W.C. (2001). Human immunodeficiency virus type 1 entry Inhibitors PRO 542 and T-20 are potently synergistic in blocking virus-cell and cell-cell fusion. J. Inf. Dis. *183*, 1121-1125.

Professional organizations and societies

American Association for the Advancement of Science
American Medical Association
American Society for Microbiology
Columbia University Alumni Association
International AIDS Society
International Society for Antiviral Research
New York Academy of Sciences
Phi Beta Kappa Society